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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,922	08/04/2003	Moungi G. Bawendi	14952.0274 C1 D1/MIT 8096	4946
27890	7590	11/15/2006	EXAMINER	
STEPTOE & JOHNSON LLP 1330 CONNECTICUT AVENUE, N.W. WASHINGTON, DC 20036			TRAN, MY CHAU T	
			ART UNIT	PAPER NUMBER
			1639	

DATE MAILED: 11/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Advisory Action</b> <b>Before the Filing of an Appeal Brief</b>	Application No.	Applicant(s)	
	10/632,922	BAWENDI ET AL.	
	Examiner	Art Unit	
	MY-CHAU T. TRAN	1639	

**--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

THE REPLY FILED 17 October 2006 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:

- a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.  
b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on \_\_\_\_\_. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

#### AMENDMENTS

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because  
(a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);  
(b) ☐ They raise the issue of new matter (see NOTE below);  
(c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or  
(d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: \_\_\_\_\_. (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).  
5. ☐ Applicant's reply has overcome the following rejection(s): \_\_\_\_\_.  
6. ☐ Newly proposed or amended claim(s) \_\_\_\_\_ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).  
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☒ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.  
The status of the claim(s) is (or will be) as follows:  
Claim(s) allowed: NONE.  
Claim(s) objected to: NONE.  
Claim(s) rejected: 1-3, 12, 13, 26, 27, 31-33 and 37-39.  
Claim(s) withdrawn from consideration: NONE.

#### AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).  
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).  
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

#### REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because:  
See Attached Sheet.  
12. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08) Paper No(s). \_\_\_\_\_.  
13. ☐ Other: \_\_\_\_\_.

PETER PARAS, JR.  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1600

*Pete Paras*

**ADVISORY ACTION (CONT.)**

***Application and Claims Status***

1. Applicant's amendment and response filed 10/17/2006 are acknowledged and entered.
2. Claims 1-39 were pending. Applicants have amended claims 1, 26, and 37, and cancelled claims 4-11, 14-25, 28-30, and 34-36. No claims were added. Therefore, claims 1-3, 12, 13, 26, 27, 31-33, and 37-39 are currently pending and under consideration.

***Status of Claim(s) Objection(s) and /or Rejection(s)***

3. The objection of claims 1, 26, and 37 has been withdrawn in light of applicant's amendments of claims 1, 26, and 37. All other rejections are maintained and the arguments are addressed below.

***Response to Arguments***

4. Applicant's arguments directed to the 102(b) as being anticipated by Zarling et al. (US Patent 5,674,698) rejection were considered but they are not persuasive for the following reasons.

[1] Applicant contends that "*Zarling does not describe a nanocrystal that includes a Group II-VI semiconductor, a Group III-V semiconductor, a Group IV semiconductor, or an alloy or mixture thereof*".

[2] Applicant alleges that Zarling does not describe "*a core including a first semiconductor material and a shell layer overcoating the core*".

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[3] Applicant argues that Zarling does not describe “*the shell including a second semiconductor material having a band gap greater than that of the core*”.

Thus, the compositions of Zarling et al. do anticipate the presently claimed invention.

This is not found persuasive for the following reasons:

[1] The examiner respectfully disagrees. It is the examiner's position that Zarling et al. do teach ‘*nanocrystal that includes a Group II-VI semiconductor, a Group III-V semiconductor, a Group IV semiconductor, or an alloy or mixture thereof*’.

First, the instant claims do not further limit the limitations of “*includes a Group II-VI semiconductor, a Group III-V semiconductor, a Group IV semiconductor, or an alloy or mixture thereof*”, i.e. there is no dependent claims these limitations of independent claims 1, 26, and 37. Thus, the scope of the claimed ‘*nanocrystal*’ would encompass any ‘*semiconductor*’ members of group II thru group VI (group II-VI) of the chemical periodic table.

Second, the instant specification define that nanocrystal to include a core surrounded by a shell (see specification pg. 9, lines 23-24) wherein ‘*the core and/or the shell can be a semiconductor material including, but not limited to, those of the group II-VI (ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, MgTe and the like) and III-V (GaN, GaP, GaAs, GaSb, InN, InP, InAs, InSb, AlAs, AlP, AlSb, AlS, and the like) and IV (Ge, Si, Pb and the like) materials, and an alloy thereof, or a mixture thereof*’ (see specification, pg. 9, line 28 thru pg. 10, line 3). The phrase “*but not limited to*” imply that the exemplary members of semiconductor material for each group does not exclude other members, i.e. the disclosures that ‘*group II-VI (ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, MgTe and the like)*’ would not exclude other members (semiconductor material) of group II thru group VI (group II-VI) of the chemical

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periodic table. Moreover, applicants support their argument using the instant specification disclosure regarding 'Group III-V semiconductor' on page 10 lines 1-3 wherein "*Each example in the list includes a group III element (Ga, In, Al) and a group V element (N, P, As, Sb) but no others*". However, the listed example for 'Group III-V semiconductor' include "AlS" which is from Group IIIA and Group VIA of the chemical periodic table, and as a result the exemplary members of semiconductor material for group III-V does not include *only* group III elements and Group V elements as stated by applicants.

Accordingly, the claimed nanocrystal would not exclude the up-converting phosphor particles of Zarling et al. wherein the phosphor material compositions include material such as Ytterbium and Erbium, i.e. the compounds are Group III semiconductor of the claimed 'semiconductor nanocrystal' (Zarling: col. 16, lines 19-67; col. 16, Table I).

[2] The examiner respectfully disagrees. It is the examiner's position that Zarling et al. do teach "*a core including a first semiconductor material and a shell layer overcoating the core*". Zarling et al. disclose that the up-converting phosphor particles comprise host materials dope with an activator couple (absorber and emitting center), i.e. the center (core) has a shell layer (host materials)(Zarling: col. 14, lines 16-21 and lines 33-37). In addition, Zarling et al. disclose that the absorber and the emitting center include material such as Ytterbium and Erbium, i.e. the compounds are Group III semiconductor of the claimed 'semiconductor nanocrystal' and the host material include materials such as lanthanum fluoride and barium yttrium fluoride, i.e. semiconductor material. Thus, Zarling et al. do teach "*a core including a first semiconductor material and a shell layer overcoating the core*".

[3] The examiner respectfully disagrees. It is the examiner's position that Zarling et al. do teach that *"the shell including a second semiconductor material having a band gap greater than that of the core"*. Zarling et al. disclose that the host material include materials such as lanthanum fluoride and barium yttrium fluoride, i.e. semiconductor material. In addition, the instant specification define that nanocrystal to include a core surrounded by a shell (see specification pg. 9, lines 23-24) wherein *'the core and/or the shell can be a semiconductor material including, but not limited to, those of the group II-VI (ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, MgTe and the like) and III-V (GaN, GaP, GaAs, GaSb, InN, InP, InAs, InSb, AlAs, AlP, AlSb, AlS, and the like) and IV (Ge, Si, Pb and the like) materials, and an alloy thereof, or a mixture thereof'* (see specification, pg. 9, line 28 thru pg. 10, line 3). The phrase *"but not limited to"* imply that the exemplary members of semiconductor material for each group does not exclude other members, i.e. the disclosures that *'group II-VI (ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, MgTe and the like)'* would not exclude other members (semiconductor material) of group II thru group VI (group II-VI) of the chemical periodic table. Moreover, the limitation of *"having a band gap greater than that of the core"* is interpreted as the functional/property limitation of the instant claimed shell, and since the host material of Zarling et al. is substantially identical in structure as the claimed shell this functional/property limitation would also be present in the host material of Zarling et al. See MPEP § 2112.01, which states that *"Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for*

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*believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990)". Hence, Zarling et al. do teach that "the shell including a second semiconductor material having a band gap greater than that of the core".*

Therefore, the teachings of Zarling et al. do anticipate the compounds of the instant claims, and the rejection is maintained.

5. Applicant's arguments directed to the 112, second paragraph, rejection were considered but they are not persuasive for the following reasons.

[1] Applicant contends that *"The phrase 'Group II-VI semiconductor' does not set forth a range. The phrase does not indicate a semiconductor that includes an element of any of Groups II, III, VI, V, or VI. Rather, 'Group II-VI semiconductor' refers to a semiconductor that includes both a Group II element and a Group VI element. This terminology is common in the semiconductor arts. The same is true for the phrase 'Group III-V semiconductor,' which refers to a semiconductor including both a Group III element and a Group V element, and not to a semiconductor including elements from any of Groups III, IV, or V".*

This is not found persuasive for the following reasons:

[1] The examiner respectfully disagrees. It is the examiner's position that the limitations of *"a Group II-VI semiconductor, a Group III-V semiconductor, a Group IV semiconductor"* of claims 1, 26, and 37 is indefinite because the phrases *'Group III-V semiconductor'* and *'Group III-V semiconductor'* do set forth ranges. The dash in the phrase *"Group II-VI semiconductor"* and the *"Group III-V semiconductor"* imply a range. Moreover, applicant's arguments (i.e. *"This*

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*terminology is common in the semiconductor arts.*") do not rise to the level of factual evidence.

See MPEP § 716.01(c): The arguments of counsel cannot take the place of evidence in the record. See *In re Schulze*, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965). Furthermore, the instant specification is not consistent with applicant interpretation of these phrases. The instant specification on page 9, line 28 thru page 10, line 3 disclose that *'the core and/or the shell can be a semiconductor material including, but not limited to, those of the group II-VI (ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, MgTe and the like) and III-V (GaN, GaP, GaAs, GaSb, InN, InP, InAs, InSb, AlAs, AlP, AlSb, AlS, and the like) and IV (Ge, Si, Pb and the like) materials, and an alloy thereof, or a mixture thereof'*. The phrase **"but not limited to"** imply that the exemplary members of semiconductor material for each group does not exclude other members, i.e. the disclosures that *'group II-VI (ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, MgTe and the like)'* would not exclude other members (semiconductor material) of group II thru group VI (group II-VI) of the chemical periodic table. In addition, the listed example for *'Group III-V semiconductor'* include *"AlS"* which is from Group IIIA and Group VIA of the chemical periodic table, and as a result the exemplary members of semiconductor material for group III-V does not include **only** group III elements and Group V elements

Therefore, the limitations of *"a Group II-VI semiconductor, a Group III-V semiconductor, a Group IV semiconductor"* of claims 1, 26, and 37 is indefinite because the phrases *'Group III-V semiconductor'* and *'Group III-V semiconductor'* do set forth ranges, and the rejection is maintained.



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6. Applicant's arguments directed to the 103(a) as being unpatentable over Dower et al. (US Patent 5,770,358) in view of Zarling et al. (US Patent 5,674,698) rejection were considered but they are not persuasive for the following reasons.

[1] Applicant contends that the combine teachings of Dower et al. and Zarling et al. do render the product of the instant claims *prima facie* obvious because Zarling et al. "*fails to teach all the limitations of independent claims 1, 26 and 37*", and thus do not remedy the of Dower et al.

This is not found persuasive for the following reasons:

[1] The examiner respectfully disagrees. It is the examiner's position that the combine teachings of Dower et al. and Zarling et al. do render the product of the instant claims *prima facie* obvious because Zarling et al. do teach all the limitations of 'independent claims 1, 26 and 37' as fully discussed in paragraph 4 above.

Therefore, the combine teachings of Dower et al. and Zarling et al. do render the product of the instant claims *prima facie* obvious, and the rejection is maintained.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to My-Chau T. Tran whose telephone number is 571-272-0810. The examiner can normally be reached on Monday: 8:00-2:30; Tuesday-Thursday: 7:30-5:00; Friday: 8:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Paras, Jr., can be reached on 571-272-4517. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

mct

November 6, 2006